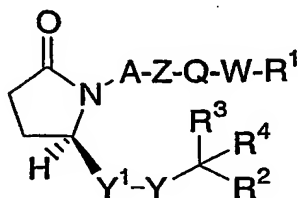


## WHAT IS CLAIMED IS:

1. A compound having the structural formula I:



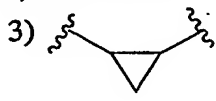
FORMULA I

or a pharmaceutically acceptable salt thereof, wherein,

Y¹ is

1) CH<sub>2</sub>CH<sub>2</sub>,

2) CHCH, or



Y is C(O) or CH(OH);

A is (CH<sub>2</sub>)<sub>n</sub>;

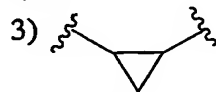
n is 1, 2, 3, or 4;

W a bond, unsubstituted C 1-6 alkylene, or C 1-6 alkylene substituted with 1, 2, 3, or 4 halogen atoms;

Z is

1) O,

2) S,

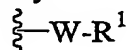


4) HC=CH,

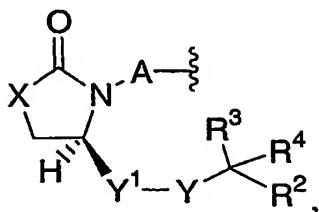
5) C≡C, or

6) a bond;

Q is a disubstituted aryl or heteroaryl ring, wherein one ring atom of the ring is attached to the moiety



and another ring atom is attached to the moiety



R<sup>1</sup> is

COR<sup>5</sup>,

OH,

CN,

(CH<sub>2</sub>)<sub>1-3</sub> CO<sub>2</sub>R<sup>6</sup>,

C(O)NHSO<sub>2</sub>R<sup>8</sup>,

SO<sub>2</sub>R<sup>7</sup>,

(CH<sub>2</sub>)<sub>0-4</sub>SO<sub>3</sub>R<sup>6</sup>,

CF<sub>2</sub>SO<sub>2</sub>NH<sub>2</sub>,

SO<sub>2</sub>NH<sub>2</sub>,

SO<sub>2</sub>NHCOR<sup>8</sup>,

PO(OR<sup>7</sup>)<sub>2</sub>,

C<sub>1-4</sub> alkoxy,

hydroxymethylketone, or

(CH<sub>2</sub>)<sub>0-4</sub>R<sup>k</sup>, wherein R<sup>k</sup> is unsubstituted or substituted with 1 to 3 groups of R<sup>a</sup>;

R<sup>2</sup> is

1) C<sub>1-6</sub>alkyl,

2) (CH<sub>2</sub>)<sub>0-8</sub>C<sub>6-10</sub>aryl,

3) (CH<sub>2</sub>)<sub>0-8</sub>R<sup>m</sup>,

4) (CH<sub>2</sub>)<sub>0-8</sub>C<sub>3-8</sub>cycloalkyl,

5) O-C<sub>1-10</sub>alkyl,

6) O-C<sub>6-10</sub>aryl,

7) O-R<sup>m</sup>,

8) O-C<sub>3-10</sub>cycloalkyl

wherein aryl, R<sup>m</sup>, and cycloalkyl are unsubstituted or substituted with 1-3 groups of R<sup>b</sup>;

R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of

1) halogen, and

2) C<sub>1-6</sub> alkyl, or

R<sup>3</sup> and R<sup>4</sup>, together with the carbon atom to which they are attached, form a C<sub>3-7</sub> cycloalkyl ring;

R<sup>5</sup> is

- 1) hydrogen,
- 2) OH,
- 3) CH<sub>2</sub>OH,
- 5 4) C<sub>1-6</sub> alkoxy,
- 5) NHPO<sub>2</sub>R<sup>6</sup>,
- 6) NHR<sup>9</sup>,
- 7) NHSO<sub>2</sub>R<sup>8</sup>, or
- 8) NR<sup>6</sup>R<sup>7</sup>;

- 10 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting of hydrogen, C<sub>1-6</sub> alkyl, and C<sub>3-8</sub> cycloalkyl;

R<sup>8</sup> is selected from the group consisting of hydrogen, C<sub>6-10</sub>aryl, R<sup>n</sup>, and C<sub>1-4</sub>alkyl;

R<sup>9</sup> is C(O)R<sup>10</sup> or SO<sub>2</sub>R<sup>10</sup>;

R<sup>10</sup> is hydrogen, C<sub>6-10</sub> aryl, or C<sub>1-4</sub> alkyl;

- 15 R<sup>a</sup> and R<sup>b</sup> are independently selected from the group consisting of

- 1) C<sub>1-6</sub>alkoxy,
- 2) C<sub>1-6</sub>alkyl, unsubstituted or substituted with
  - a) C<sub>1-6</sub> alkoxy,
  - b) C<sub>1-6</sub> alkylthio,
  - 20 c) CN,
  - d) OH, or
  - e) CF<sub>3</sub>,

3) CF<sub>3</sub>,

4) nitro,

- 25 5) amino,

6) cyano,

7) C<sub>1-6</sub>alkylamino,

8) halogen

9) OR<sup>c</sup>,

- 30 10) OCH<sub>2</sub>R<sup>c</sup>, and

11) CH<sub>2</sub>OR<sup>c</sup>;

R<sup>c</sup> is

1) C<sub>6-10</sub>aryl,

2) R<sup>s</sup>, or

- 35 3) C<sub>3-8</sub>cycloalkyl; and

$R^k$ ,  $R^m$ ,  $R^n$  and  $R^s$  are independently selected from the group consisting of

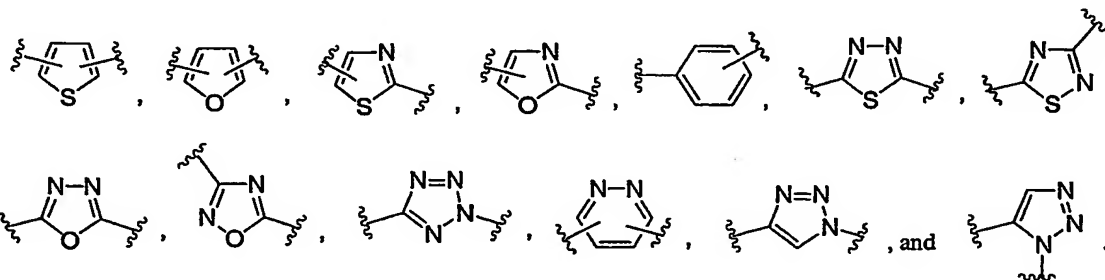
- 1) a stable monocyclic heteroaryl ring having 5, 6 or 7 ring atoms, or a stable bicyclic heteroaryl ring having 8, 9, 10, or 11 ring atoms, wherein the monocyclic ring has 1, 2, 3, or 4 heteroatoms, independently selected from the group consisting of O, S or N, and wherein the bicyclic ring has 1, 2, 3, or 4 heteroatoms, independently selected from the group consisting of O, S or N, and
- 2) a stable monocyclic or bicyclic heterocycloalkyl ring system a stable, saturated monocyclic or bicyclic ring system having 3 to 10 ring atoms, wherein 1, 2, 3, or 4 ring atoms are heteroatoms selected from O, S and N.

2. The compound of Claim 1, or a pharmaceutically acceptable salt thereof, wherein  $Y^1$  is CHCH and Y is CH(OH).

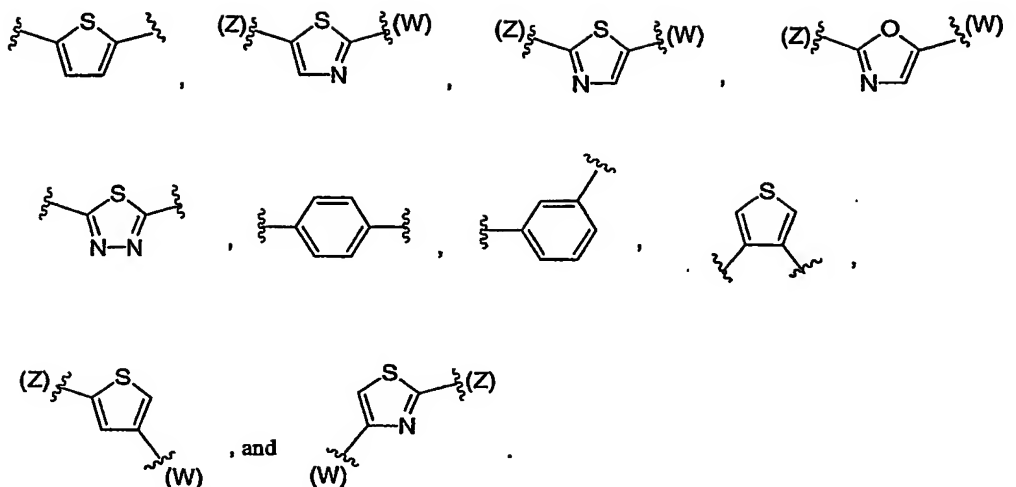
3. The compound of Claim 2, or a pharmaceutically acceptable salt thereof, wherein A is  $(CH_2)_{1-3}$  and W is a bond or  $(CH_2)_{1-3}$ .

4. The compound of Claim 3, or a pharmaceutically acceptable salt thereof, wherein 1)  $R^1$  is COOH or tetrazole, 2)  $R^2$  is phenyl, and 3)  $R^3$  and  $R^4$  are independently selected from the group consisting of hydrogen and halogen, or  $R^3$  and  $R^4$  together with the carbon to which they are attached, form a cyclopropyl ring.

5. The compound of Claim 4, or a pharmaceutically acceptable salt thereof, wherein Q is selected from the group consisting of



6. The compound of Claim 5, or a pharmaceutically acceptable salt thereof, wherein Q is selected from the group consisting of



7. The compound of Claim 6 selected from the group consisting of

- 5 (1) 5-(3-((2R)-2-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl)propyl)thiophene-2-carboxylic acid,
- (2) (5R)-5-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{3-[5-(1H-tetrazol-5-yl)thien-2-yl]propyl}pyrrolidin-2-one,
- 10 (3) 5-(3-((2R)-2-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl)propyl)-1,3-thiazole-2-carboxylic acid,
- (4) 2-(3-((2R)-2-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl)propyl)-1,3-thiazole-5-carboxylic acid,
- 15 (5) (5R)-5-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{3-[5-(1H-tetrazol-5-yl)-1,3-thiazol-2-yl]propyl}pyrrolidin-2-one,
- (6) 2-(3-((2R)-2-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl)propyl)-1,3-thiazole-4-carboxylic acid,
- 20 (7) [5-(2-((2R)-2-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl)ethyl)thien-2-yl]acetic acid,

- (8) (5*R*)-5-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{2-[5-(1*H*-tetraazol-5-ylmethyl)thien-2-yl]ethyl}pyrrolidin-2-one,
- (9) 2-(3-{(2*R*)-2-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl}propyl)-1,3-oxazole-5-carboxylic acid,
- (10) 5-(3-{(2*R*)-2-[(1*E*)-3-hydroxy-3-(1-phenylcyclopropyl)prop-1-enyl]-5-oxopyrrolidin-1-yl}propyl)thiophene-2-carboxylic acid,
- (11) (5*R*)-5-[(1*E*)-3-hydroxy-3-(1-phenylcyclopropyl)prop-1-enyl]-1-{3-[5-(1*H*-tetraazol-5-yl)thien-2-yl]propyl}pyrrolidin-2-one,
- (12) 5-(3-{(2*R*)-2-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl}propyl)-1,3,4-thiadiazole-2-carboxylic acid,
- (13) 4-(3-{(2*R*)-2-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl}propyl)benzoic acid,
- (14) 3-(3-{(2*R*)-2-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl}propyl)benzoic acid,
- (15) (5*R*)-5-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{3-[3-(1*H*-tetraazol-5-yl)phenyl]propyl}pyrrolidin-2-one,
- (16) (5*R*)-5-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{3-[4-(1*H*-tetraazol-5-yl)phenyl]propyl}pyrrolidin-2-one,
- (17) 3-[5-({(2*R*)-2-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-5-oxopyrrolidin-1-yl}methyl)thien-2-yl]propanoic acid,
- (18) (5*R*)-5-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-({5-[2-(1*H*-tetraazol-5-yl)ethyl]thien-2-yl}methyl)pyrrolidin-2-one,
- (19) (5*R*)-5-[(1*E*)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-({4-[3-(1*H*-tetraazol-5-yl)propyl]thien-3-yl}methyl)pyrrolidin-2-one,

(20) (5R)-5-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-({4-[2-(1H-tetraazol-5-yl)ethyl]thien-2-yl}methyl)pyrrolidin-2-one,

(21) (5R)-5-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-({4-[2-(1H-tetraazol-5-yl)ethyl]-1,3-thiazol-2-yl}methyl)pyrrolidin-2-one, and

(22) (5R)-5-[(1E)-4,4-difluoro-3-hydroxy-4-phenylbut-1-enyl]-1-{3-[2-(1H-tetraazol-5-yl)ethyl]benzyl}pyrrolidin-2-one,

and pharmaceutically acceptable salts thereof.

8. A method for treating disorders related to elevated intraocular pressure by: treating ocular hypertension, treating glaucoma, treating macular edema, treating macular degeneration, increasing retinal and optic nerve head blood velocity, increasing retinal and optic nerve tension, providing a neuroprotective effect or treating dry eyes, comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of Claim 1, or a pharmaceutically acceptable salt thereof.

9. A topical composition comprising the compound of formula I as defined in any one of Claims 1 to 7, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

10. The composition of Claim 9, wherein the composition comprises xanthan gum or gellan gum.

11. The composition of Claim 10, wherein the composition is a solution or a suspension.

12. The method according to Claim 8 further comprising administering to the patient an active ingredient selected from the group consisting of a  $\beta$ -adrenergic blocking agent, a parasympatho-mimetic agent, a Maxi-K channel blocker, a sympathomimetic agent, a carbonic anhydrase inhibitor, a prostaglandin, a hypotensive lipid, a neuroprotectant, and a 5-HT<sub>2</sub> receptor agonist, is added to the formulation.

13. The method according to Claim 12 wherein the  $\beta$ -adrenergic blocking agent is timolol, betaxolol, levobetaxolol, carteolol, or levobunolol; the parasympathomimetic agent is pilocarpine; the Maxi-K channel blocker is Penitrem A, paspalicine, charybdotoxin, or iberiotoxin, the sympathomimetic agent is epinephrine, brimonidine, iopidine, clonidine, or para-aminoclonidine; the carbonic anhydrase inhibitor is dorzolamide, acetazolamide, metazolamide or brinzolamide; the prostaglandin is latanoprost, travaprostone, unoprostone, rescala, or S1033; the hypotensive lipid is lumigan; the neuroprotectant is eliprodil, R-eliprodil or memantine; and the 5-HT<sub>2</sub> receptor agonist is 1-(2-aminopropyl)-3-methyl-1H-imidazol-6-ol fumarate or 2-(3-chloro-6-methoxy-indazol-1-yl)-1-methyl-ethylamine.

14. A compound of formula I of any one of Claims 1 to 7, or a pharmaceutically acceptable salt thereof, for use in medicinal therapy.

15. Use of a compound of formula I of any one of Claims 1 to 7, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for treating disorders related to elevated intraocular pressure.

16. Use of a compound of formula I of any one of Claims 1 to 7, or a pharmaceutically acceptable salt thereof, as a selective EP<sub>4</sub> receptor agonist.